



Colorado State University Symposia Series on Emerging Concepts and Trends in Infectious Diseases Research

2018 Symposium Topic “The Metabolism of Infectious Diseases”

The Metabolism of Infectious Diseases Symposium will bring together scientists representing a breadth of infectious diseases and immunology research, with a collective interest in studying the metabolism of pathogens and their hosts.

The goals are:

- Provide a current and comprehensive understanding of the role of metabolism in infectious diseases.
- Highlight emerging technologies and approaches important for studying infectious disease metabolism.
- Understand how information and knowledge gained through the study of metabolism can be translated into interventions to prevent or control infectious disease.
- Create an opportunity for the formulation of new hypotheses and collaborations.

Specific topics that will be addressed:

- The role of immunometabolism in infectious diseases
- Pathogen and host interactions leading to adaptation of metabolic states and processes
- Communication and signaling via small molecule metabolites
- Emerging technologies and translation

Oral presentations will be chosen from abstracts

Limited number of student & post-doc travel awards are available

REGISTRATION: <https://metabolism.idrtalks.colostate.edu/>

Confirmed Speakers

Keynote Address

Alan Aderem

<https://www.cidresearch.org/labs/aderem>

Center for Infectious Disease Research,
Seattle, WA

Plenary Speakers

Thomas Weichart, PhD. Institute of Medical Genetics Medical University of Vienna	Jason Mackenzie, PhD School of Biomedical Sciences, University of Melbourne
Hyungjin Eoh, DVM, PhD Molecular Microbiology and Immunology Keck School of Medicine University of Southern California	Shuzao Li, PhD Division of Pulmonary, Allergy, Critical Care and Sleep Medicine Emory Univ. School of Medicine
Catherine Lozupone, PhD Division of Biomedical Informatics Department of Medicine and Personalized Medicine University of Colorado, Denver	Edana Cassol, PhD Faculty of Science Department of Health Sciences Carleton University, Ottawa
Vanessa Phelan, PhD Department of Pharmaceutical Sciences Skaggs School of Pharmacy and Pharmaceutical Sciences University of Colorado, Denver	Carolina Barillas Mury, MD, PhD Laboratory of Malaria and Vector Research National Institutes of Health
Kathleen Stringer, PharmD Department of Clinical Pharmacy College of Pharmacy University of Michigan	Cristina Pessolani, PhD Cellular Microbiology, Oswaldo Cruz Foundation (FIOCRUZ) Rio de Janeiro
Gary Patti, PhD Department of Chemistry, Washington University in St. Louis	Joshua C. Munger, PhD School of Medicine and Dentistry University of Rochester Medical Center
David Schneider, PhD Microbiology and Immunology Stanford University	

Agenda

Jun 12, 2018 (Tuesday)

Opening Session

4:00 pm – Registration opens, packet pickup (Lory Student Center Ballroom D)

5:00 pm – Welcome and opening remarks

5:15 – 6:15 pm - Keynote Address: *“Using the tools of systems biology to dissect the immune system”* **Dr. Alan Aderem (Professor and President Emeritus, Center for Infectious Disease Research, Seattle, WA)**

6:15-7:15 pm – Opening reception with cocktails, appetizers

Jun 13, 2018 (Wednesday)

7.00-8.00 am Networking and Coffee

Session 1. We Should Talk – *Immunometabolism... from protection to pathology*

8.00-8:30 am Plenary Presentation - *“(m)TORching metabolism in macrophages”* **Thomas Weichart, PhD, Medical University of Vienna**

8:30-8:50 am Abstract Presentation - *“Indoleamine 2,3, dioxygenase mediated modulation of immune responses to Mycobacterium tuberculosis: a target for host-directed therapeutics”* **Deepak Kaushal, PhD, Tulane University**

8:50-9:10 am Abstract Presentation – *“Francisella tularensis phospholipids utilize unique very long chain acyl motifs to manipulate host fatty acid metabolism”* **Benjamin Schwarz, PhD, Rocky Mountain Laboratories, NIH**

9:10-9:40 am Plenary Presentation - *“Multi-omics approach to characterize metabolic reprogramming of innate immune responses in HIV infection”* **Edana Cassol, PhD, Carleton University**

9:40-10:10 am Morning coffee break

Session 2. Building a Home – *Pathogen manipulation of host metabolism*

10:10-10:40 am Plenary Presentation - *“The pro’s and con’s of host lipids during flavivirus replication”* **Jason Mackenzie, PhD, University of Melbourne**

10:40-11.00 am Abstract Presentation - *“Pathogen manipulation of host metabolism: A common strategy for immune evasion”* **Eric Harvill, PhD, University of Georgia**

11:00-11:20 am Abstract Presentation – *“MALDI FT-ICR mass spectrometry imaging reveals dysregulated lipid and small molecule metabolites in tissues harvested from mice infected with a bacterial or viral pathogens”* **Lisa Cazares, PhD, USAMRIID**

11:20-11:50 am Plenary Presentation – “*Modulation of host metabolism by the intracellular pathogen Mycobacterium leprae: implications in leprosy pathogenesis*”, **Cristina Pessolani, PhD, Oswaldo Cruz Foundation (FIOCRUZ)**

11:50 - 1:20 pm Lunch (Lory Student Center Ballroom C)

Session 3. Not Lost in Translation – Targeting metabolism for therapeutics and biomarkers

1:20-1:50 pm Plenary Presentation - “*Application of Metabolomics to Advance Understanding of Drug Action*” **Kathleen Stringer, PharmD, University of Michigan**

1:50-2:10 pm Abstract Presentation – “*Analysis of the Metabolic Pathways Affected during Cannabinoid Receptor Activation and Its Impact on Alphavirus Replication*” **J. Jordan Steel, PhD, Colorado State University-Pueblo**

2:10-2:30 pm Abstract Presentation – “*Viral infection induces metabolic reprogramming in human respiratory cells: a host target with therapeutic potential*” **Heather Smallwood, PhD, University of Tennessee Health Science Center**

2:30-3:00 pm Plenary Presentation - “*Trehalose metabolism of hypoxia induced quiescent state in Mycobacterium tuberculosis*” **Hyungjin Eoh, DVM, PhD, University of Southern California**

3:00-3:30 pm Afternoon coffee break

Student/Post Doctoral Fellow Presentations

3:30-3:45 pm - “*Novel metabolomic biomarkers of early-life “infections and growth: models of environmental enteropathy and field validation*” **Natasa Giallourou, PhD, Imperial College London**

3:45-4:00 pm - “*The effect of synthetic cystic fibrosis sputum media on Pseudomonas aeruginosa secondary metabolism*” **Rachel L. Neve, University of Colorado-Denver**

4:00-4:15 pm - “*Antibacterial and antiviral immune responses are associated with differential reprogramming of mitochondrial function in mouse bone marrow derived macrophages*” **Duale Ahmed, Carleton University**

4:15-4:30 pm - “*Role of 2-Alkyl-4-quinolones in Pseudomonas aeruginosa pathogenesis*” **Luke Brewer, University of Maryland Baltimore**

4:30-4:45 pm – “*The Non-oxidative branch of the pentose phosphate pathway contributes to antioxidative and antinitrosative defenses in Salmonella*” **Jeff A. Shaw, Creighton University**

4:45-7:00 pm Happy Hour, Networking, Posters Presentations

Jun 14, 2018 (Thursday)

7:00-8:00 am Networking and Coffee

Session 4. Dumpster Diving - *Metabolic adaptation by pathogens*

8:00-8:30 am Plenary Presentation - "*Characterizing the Chemotypic Landscape of Polymicrobial Communities*" **Vanessa Phelan, PhD, University of Colorado-Denver**

8:30-8:50 am Abstract Presentation - "*Quantifying the effect of fumarate on central carbon metabolism in Plasmodium falciparum*" **Shivenda Tewari, PhD, Department of Defense Biotechnology High Performance Computing Software Applications Institute**

8:50-9:10 am Abstract Presentation - "*Cholesterol-rich microdomains in Borrelia burgdorferi*" **Alvaro Toledo, PhD, Rutgers, The State University of New Jersey**

9:10-9:40 am Plenary Presentation – "*The role of mosquito eicosanoids on antiplasmodial defense and immune priming*" **Carolina Barillas Mury, MD, PhD, National Institutes of Allergy and Infectious Diseases**

9:40-10:10 am Morning coffee break

Session 5. Bytes and Goodies - *Technologies that drive infectious disease metabolism research*

10:10-10:40 am Plenary Presentation - "*Utilizing LC-MS/MS to interrogate mechanisms of viral metabolic manipulation and vulnerability*" **Joshua C. Munger, PhD, University of Rochester Medical Center**

10:40-11:00 am Abstract Presentation - "*Visualizing the role of cholesterol metabolism in statin-mediated protection against bacterial infection*" **Allison Scott, PhD, University of Maryland Baltimore**

11:00-11:20 am Abstract Presentation - "*Using machine learning tools to identify discriminating metabolites in viral respiratory infection*" **Manuchehr Aminian, PhD, Colorado State University**

11:20-11:50 am Plenary Presentation – "*Location, location, location: therapeutic vulnerabilities of compartmentalized metabolism*" **Gary Patti, PhD, Washington University**

11:50 - 1:20 pm Lunch (Lory Student Center Ballroom C)

Session 6. Just Passing Through...Maybe – *Metabolism that promotes disease transmission and persistence*

1:20-1:50 pm Plenary Presentation – *“Mapping the trajectory of an infection through metabolic space”* **David Schneider, PhD, Stanford University**

1:50-2:20 pm Plenary Presentation – *“Multi-omics modeling of Human Immunology - Finding the right Chemistry between Genes”* **Shuzao Li, PhD, Emory University**

2:20-2:40 pm Abstract Presentation - *“Identification of biochemical choke points to limit dengue, Zika and Chikungunya virus infection in the midgut of the Aedes aegypti mosquito vector”* **Nunya Chotiwan, Colorado State University**

2:40-3:00 pm Abstract Presentation - *“The effect of physiological state on Powassan virus infection of salivary gland cultures from female Ixodes scapularis (black-legged tick): a potential role for pantothenate and CoA biosynthesis”* **Jeffrey M Grabowski, PhD, Rocky Mountain Laboratories, NIH**

3:00-3:30 pm Plenary Presentation - *“Exploring bacterial metabolites as drivers of disease phenotypes and co-morbidity in HIV infected individuals”* **Catherine Lozupone, PhD, University of Colorado-Denver**

3.30 – 4:00 pm Afternoon coffee break

Session 7. The State-of-Metabolism in Infectious Diseases

4:00 – 4:45 pm Round Table Discussion - Metabolism of Infectious Diseases – Future Challenges and Directions

4:45 – 5:00 pm **Awards for Student Presentations and Posters**

5:00 – 5:15 pm **Closing Remarks**

6:00 – 10:00 pm **Gala Dinner at the Rio Grand Mexican Restaurant (143 W Mountain Ave. Old Town Fort Collins)**

Sponsored by Colorado State University:

- Infectious Diseases Research and Response Network (IDR²N) Program of Research and Scholarly Excellence (PRSE)
- Infectious Disease Research Center (IDRC)
- Department of Microbiology, Immunology and Pathology

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